SIDEPLOUGH KSM03

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USER MANAUL

2015-2016

This user manual applies to snow ploughs from serial number 0891XXXXXX

MEIREN SNOW
Push your limits. Expand your boundaries.

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CE DECLARATION OF CONFORMITY

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We hereby declare that the below mentioned product

Highway side wing snow plough

MEIREN SNOW KSM3103
KSM3703

Model: .....

Serial number: .....

Manufacturing date: .....

meets the following directives and standards:

2006/42/EC
EN 349:1993+A1:2008

FOREWORD

Thank you for choosing this Meiren Snow product! This user manual contains the technical specifications of the KSM snow plough series, the product usage and maintenance instructions and the warranty terms and conditions. The KSM snow plough series is designed for removal of loose snow from hard-surface roads. This product is not suitable for removal of sand, gravel, packed snow, ice, etc. Inexpedient application of the snow plough can result in economic losses and cause human bodily harm. That is why it is essential for the person operating the snow plough to read the manual carefully and use the product in compliance with the stipulated requirements. Any misuse of the product shall release the manufacturer from liability to compensate for resulting damage and losses.

GENERAL SAFETY REQUIREMENTS

As the construction of the product is complex and it contains moving parts, it is of the utmost importance that the person working with the equipment be aware of all safety risks. To reduce the risks it is important that

- the operator have read through the operator manual;
- the operator have been given an appropriate training, which gives him the permit to use a product of this type in his work;
- the operator have been provided with all necessary tools and is wearing suitable working clothes.

PERSONNEL

This product may only be used and maintained by properly trained personnel. The operator's employer is obliged to ensure fulfilment of all user instructions and safety requirements stipulated by the manufacturer.

Before starting working with the plough, please read carefully through the operator's manual.

1. PRODUCT DESCRIPTION

The KSM side wing snow plough has durable construction. Using this plough makes possible to substantially enlarge the working width as well as clean the snow on road shoulders by cutting the ridges of the snow piles. The cutting is allowed only by the soft snow.

The cutting of frozen, compacted snow or ice is not allowed, because it can damage the plough.

Depending on the installation to the vehicle, the plough's moldboard can be raised up to 335-400 mm from the ground by using the steel blades and 250-305 mm by using the rubber blades. There is 53° angle in relation to the vehicle, when the plough is in fully opened position.

Depending on the slope of road surface can the plough's moldboard angle be varied in relation to the ground from +2 ° to -1 °. During cutting the ridges of the snow piles, the plough is in the edge about 1° higher than normally. Changing the angles of the snow plough in relation to the ground can be done by adding or removing the plastic sheets between the moldboard and the axle of rotation.

For protecting the snow plough and the frame of the vehicle even in extreme situations, there are used different shock absorbers and protect mechanisms. As the first shock absorber has the snow plough on the rear attachment of the rotating cylinder the rubber bushing, which minimize the momentary shocks and noise as well. Next protection is the hydraulic accumulator, which guarantees the backward movement of the snow ploughs moldboard by serious obstacles. If the pressure will be too high for hydraulic accumulator, the pressure relief valve opens. If the hydraulic battery proves to be insufficient and the pressure in the rotating hydraulic cylinder increases too much, the pressure relief valve opens. In especially extreme cases when the above mentioned shock absorbers prove to be insufficient, the bolts of the rear axle of the rotating hydraulic cylinder break and the cylinder moves back (for a detailed description and a drawing refer to the section 4 in this manual). In case of collision with an obstacle it is also possible that the bolts of the blade and the rubber bushings break (2, Drawing 9 and 4-5, Drawing 12).

If there are only the parallelogram of the plough (weight 386 kg) and the rear attachment (weight 160 kg) without the moldboard on the vehicle chassis, then the additional weight affecting the vehicle chassis is approx. 546 kg.

Model		**KSM3103**	**KSM3703**
Total width of cutting edges (mm)	Blade holder for steel blades	3045/3350*	3655/3960*
	Blade holder for rubber blades	3045/3350*	3655/3960*
Plough working width in max angle (mm)		2436	2923
Total width of the plough blade (mm)		3323/3650*	3892/4195*
Distance between the holes of the blade bolts (mm)		305 (10 hole) / (11 hole)	305 (12 hole) / (13 hole)
Plough height with blades (mm)	Blade holder for steel blades	587-1325	587-1455
	Blade holder for rubber blades	676-1411	675-1543
Turning angle		5° - 53°	
Tilt angle of cutting edges in relation to the ground	Blade holder for steel blades	50°	
	Blade holder for rubber blades	95°	
Plough weight in standard equipment (kg)		1010	1070

Table 1. Technical specification of the plough

* - In case of extension

Raising, bilateral action cylinder	1 pcs
Turning, bilateral action cylinder	1 pcs
Oil usage	30 - 100 l/min
Maximum work pressure	150 - 200 bar

Table 2. Hydraulics of the plough

1.1 Side wing snow plough in standard equipment:

- Lifting frame according to the vehicle
- Set of pivot cylinder with rear mounting beam
- Set of Strobe emergency lights
- Skid shoe holder (rear)
- Skid shoe VAUTID 240-300 (rear)
- Mechanical impact and vibration reducer
- Impact relief valve for pivot cylinder
- Safety markings

1.2 Accessory equipment:

- Blade holders
- Rubber or steel blades
- Extension unit 300 mm, front
- Skid shoe holder (front, attached to lifting frame)
- Skid shoe VAUTID 240-300 mm, front

2. SAFETY REQUIREMENTS FOR OPERATING THE SNOW PLOUGH

Before operating the plough:

- Check that the plough set is complete and that it is in good operational order. It is forbidden to use equipment that is not in good operational order;
- Check that there are no people or objects near the plough, which could be injured or damaged by the plough. In addition safety of people carrying out maintenance of the plough, repairing the plough or moving the plough with the help of hydraulics or any other means has to be ensured. Neglecting of the safety requirements can cause injuries to people;
- It is forbidden to work under a plough that is lifted up and not supported;
- Check that the plough is properly fastened to the truck or tractor and that the fastenings are not damaged;
- Check that the safety markings, plough side lights (if provided) and reflectors are in good operational order;
- Check the operational order of cutting edges (if provided also the condition of slide feet or wheels); The cutting edges shall be adjusted, reversed or replaced latest when the distance between the cutting edge and the fastening openings is less than 30 mm. Rubber blades must worn down or replaced at the latest when the blade reaches 10 mm below the bottom edge of the blade holder;
- Check the condition of the fastening wedges of the blades;
- Check the condition of levers and fastening pins of the cylinders;
- Check that the hydraulic hoses are intact and properly fastened;
- Check that the plough is properly greased;

- Check that the plough has no damages.

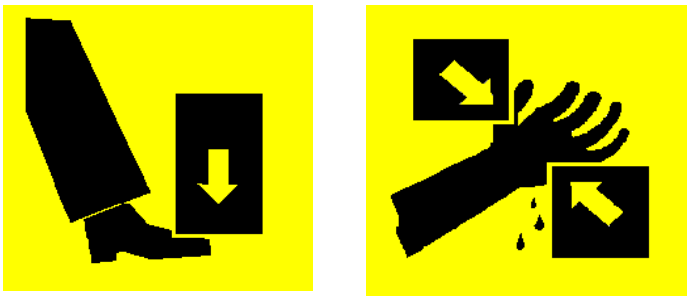
Working with the snow plough:

- To operate the plough the person shall be at least 18 years of age, shall have a driving licence of the appropriate category and shall have read through the operation instruction of the snow plough.
- Always pay attention to the surrounding and other traffic, including from the side roads and to the vehicles approaching from the rear. Pay attention to the pedestrians and cyclists not to cause them any risk when working with the snow plough.
- All warning lights must always be switched on during working!
- Follow the general traffic rules!
- The maximum permitted operation speed of the plough in normal road conditions is up to 60 km/h.
- Follow the weather conditions: when it is melting reduce the speed; when the snow is light pay attention to the wind direction and reduce the speed, if necessary.
- When working on soft ground reduce the speed, since the cutting edges may cut in the surface and you may lose control of the truck (or tractor) and the vehicle may run off the road. If the surface is soft support the plough with slide feet, wheels or an additional blade.
- The plough can only be used for removing loose snow! It is forbidden to use the plough for removing ice, frozen snowdrifts, rock, gravel, sand and other similar material.
- It is forbidden to remove the snow bank at maximum permitted full speed since this may damage the plough.
- It is forbidden to remove snow outside of road boundaries.
- In the event the highway plough is used in the city or on uneven roads where there is a risk of damaging the plough, vehicle or road surface, the user shall bear sole responsibility for such an activity. The manufacturer shall not be liable for any losses caused by the abovementioned activities.
- It is forbidden to attach such additional equipment on the moving parts of the plough that are not approved by the manufacturer.
- It is forbidden to use hydraulically operating equipment as a lifting jack.
- The plough may be lifted only from eye bolts.

ATTENTION!
Pay extra attention to when cleaning crossings. Avoid unnecessary backing. If possible, avoid snow ploughing in heavily loaded crossings and roads during peak hours.

All warning lights must always be switched on during working!

Each time there is an incident during operation that could damage the equipment, an inspection of the equipment shall be arranged with the aim of detecting and evaluating possible damages. Damages (cracks in the structure or welded joints, deformed parts) may damage property and cause injuries. It is forbidden to continue work until the damages are repaired.

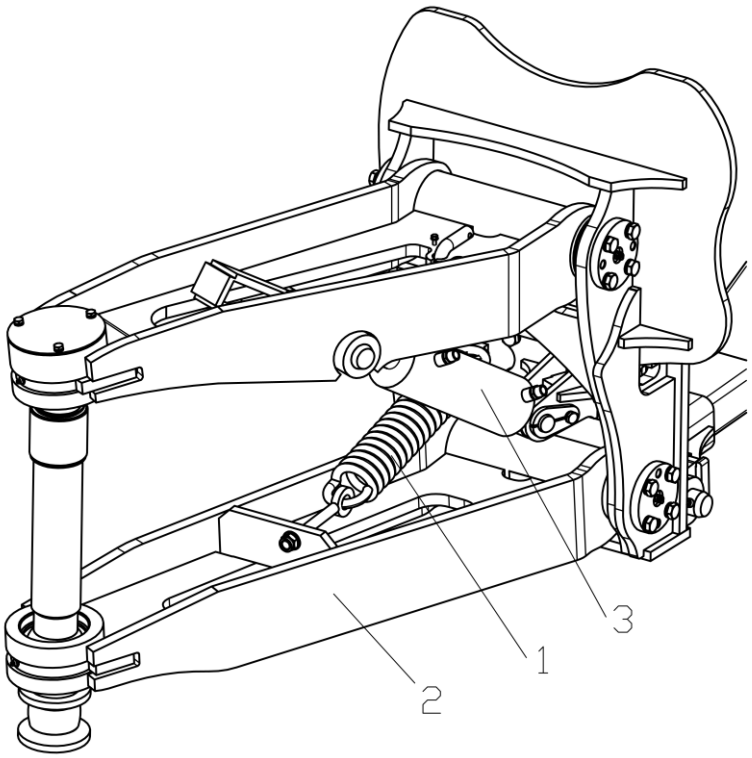


Drawing 1. Safety marking: RISK OF ACCIDENT!

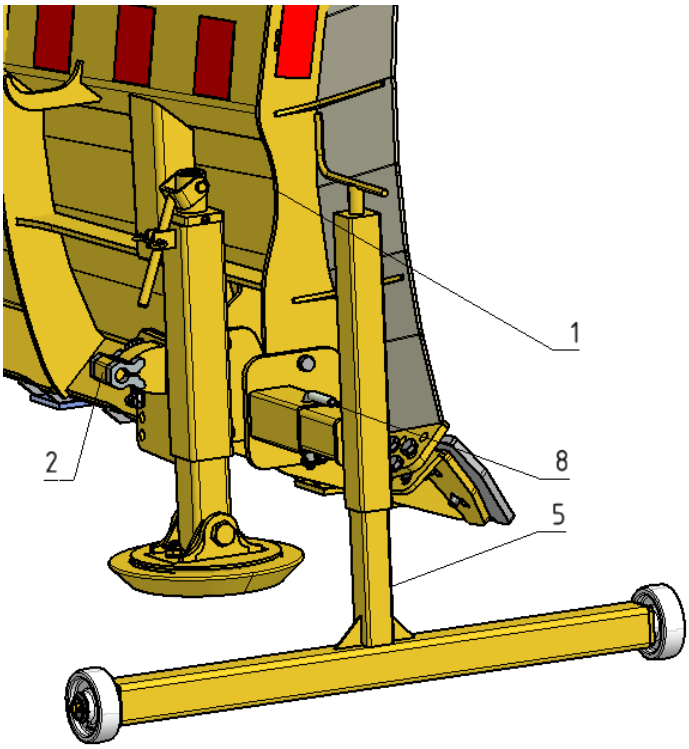
3. MOUNTING AND DEMOUNTING OF A PLOUGH

Spring of the parallelogram (1, Drawing 2) must be tightened so, that it prevents the lower arm (2) from sinking down under its own weight, **when it is not supported from the lift cylinder of the parallelogram (3).** Purpose of the spring is to reduce the impact of the parallelogram's weight to the plough's moldboard. The **pin** of the parallelogram's lift cylinder is only used by installing the plough to adjust the height of the parallelogram up/down. Always remove the pin before the operation **to ensure the floating position of the plough in relation to the road surface**.

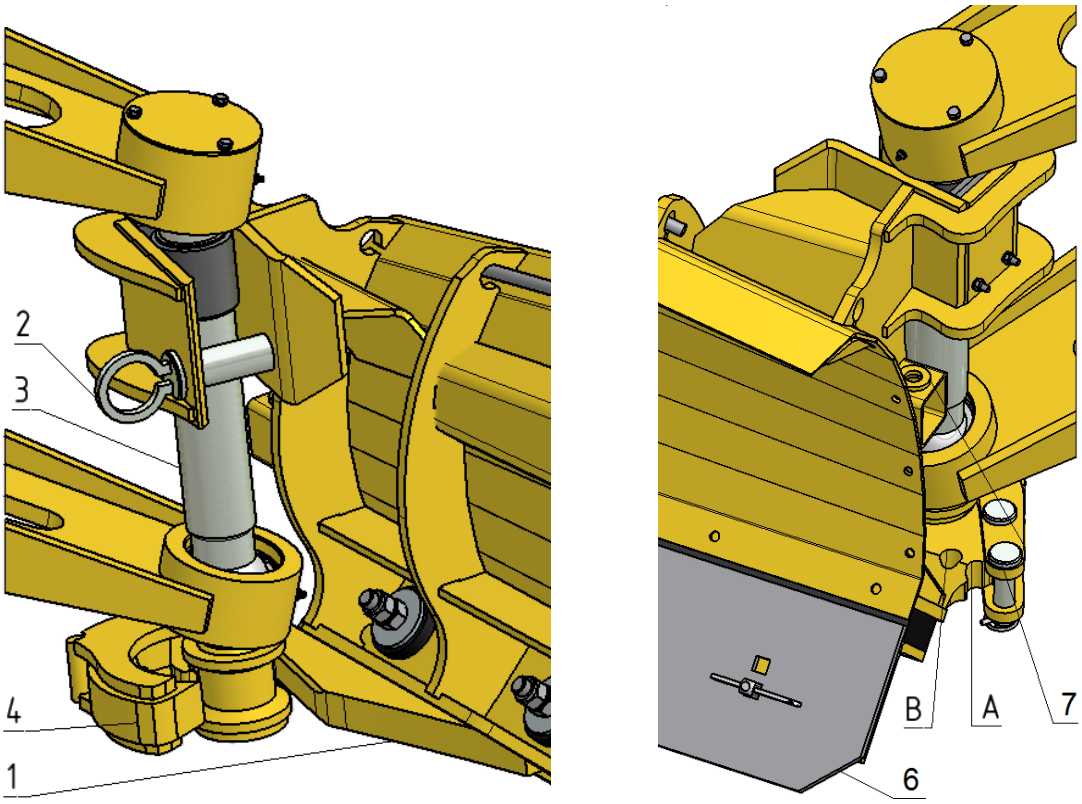
- First attach the support (5) with holder (8) to the moldboard of the plough (1, Drawing 3.3) and adjust so that the plough is raised from backside up from the ground. When installing the plough to the vehicle must be driven parallel to the moldboard of the plough, so the axle (3, Drawing 4) on the vehicle goes into the guides on the plough's moldboard. At the same time should the plough's moldboard have about 10° angle from the vehicle.
- Afterwards lock the upper guide with the respective pin (2, Drawing 4). Lock of the lower guide (4, Drawing 4) is locked with pin (7) into guide A (Drawing 4).
- Then push out the shock absorber (2, Drawing 5) from the beam that is attached to the rear of the vehicle, position the joint of the rotating hydraulic cylinder (1), axle (3) in the respective hole and lock it.
- Remove the support (5, Drawing 3.3).
- Finally connect the quick couplings on the rotating hydraulic cylinder to the couplings on the rear beam.
- Remove the pin of the lift cylinder (2, Drawing 6) and place it in the holder. Always remove the pin before operation!



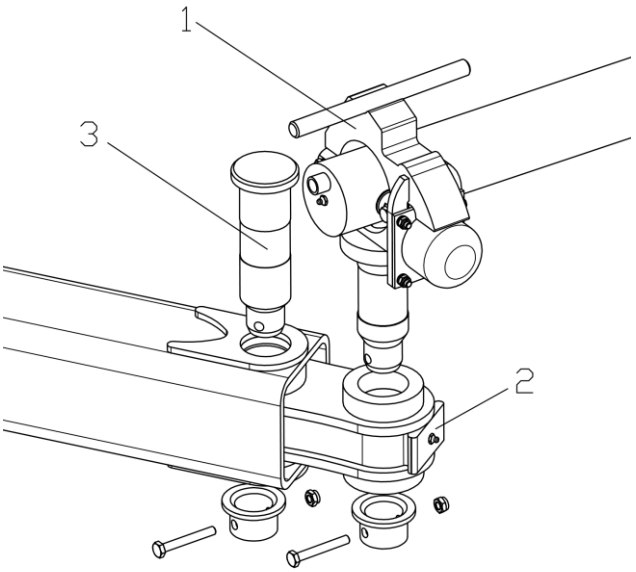
Drawing 2. Lifting frame



Drawing 3. Support for installing the plough's moldboard to the vehicle

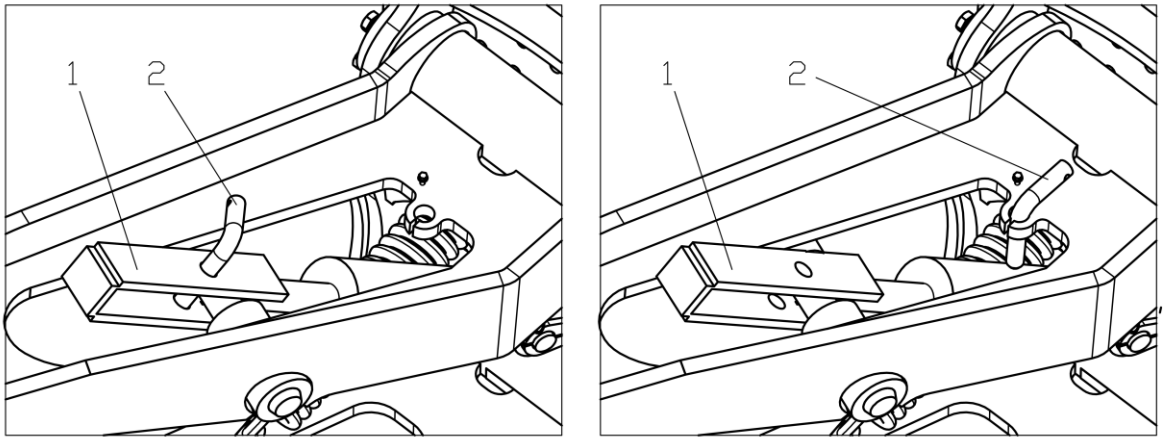


Drawing 4. Front attachment of the plough's moldboard



Drawing 5. Rear attachment

The plough's removing is analogous to attaching, only in reverse order. However, lock of the lower guide (4, Drawing 4) must be opened and locked with pin (7) into hole B.
When the plough is not in use, the shock absorber (2, Drawing 5) in the rear beam should be pushed in the beam and locked with an axle (3). Otherwise it will protrude from the vehicle dimensions.



Drawing 6. Pin of the lift cylinder

4. WORKING WITH THE PLOUGH

The plough can be used for enlarging the working width during snow removal, for cleaning the road shoulders as well as for cutting the snow-walls on the road shoulders lower.

If you plan to enlarge the working width or clean the road shoulders, the lift cylinder should be retracted completely to ensure that the plough's moldboard is in the floating position.

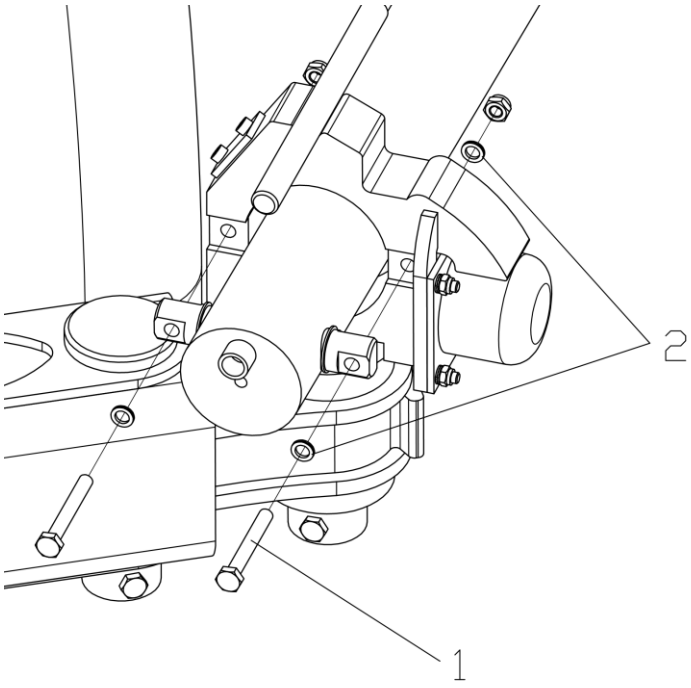
If you want to cut the snow-walls lower the plough's moldboard should be raised with the lift cylinder and the plough should be extended with the rotating hydraulic cylinder. The cylinders are operating independently and therefore the plough can be first extended and then lifted. It is also possible at any time to switch from cutting the snow-walls to cleaning the road shoulders and on the contrary.

In order to retract the plough's moldboard and lock it in the travelling position using the rear attachment, the plough's moldboard must be raised with the lift cylinder and then retracted with the rotating hydraulic cylinder.

Both rubber and steel blades can be used on the plough. In order to ensure optimal work with different types of blades the blade holders are replaceable. Rubber blades should be used when the road shoulders are still soft and not frozen. Steel blades should be used when the road shoulders are already frozen. Operation with steel blades requires the blade holders which ensures that the blades have a 40° angle in relation to the ground. Operation with rubber blades requires a blade holders which ensures, that the blades have a 95° angle in relation to the ground. Rubber blade holders have a rubber quick attachment system. There is no need to drill holes through the rubber and it speeds up the installation and replacing the rubber (refer to section 4.1.). Rubber blade holders makes possible the rubber blade and the steel blade using at the same time. In this case the steel blades can be installed in front of the rubber blade. For this purpose the rubber blade holders include wedge-bolt openings.

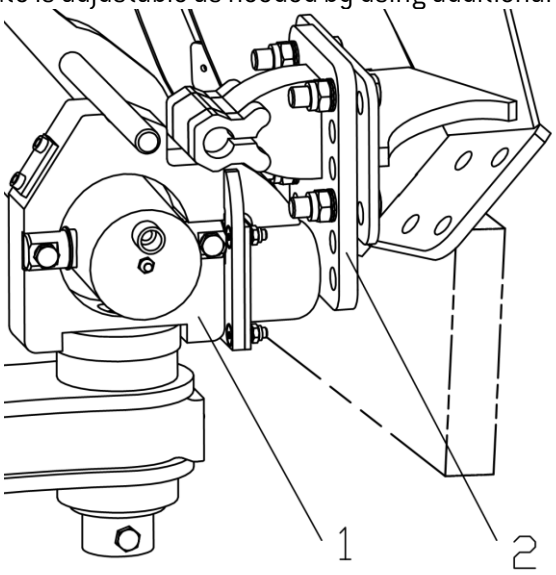
There is a 45 mm thick rubber strip between the steel blade holder and the moldboard that reduces noise and makes the response of the blades more flexible by harmonizing pressure of the blades to the road surface. Blades are fastened to the blade holders in a standard way with wedge-bolts. There are support plates under the blade holders to reduce its wear upon excessive wear of the blades.

When the side plough collides with an obstacle, the primary blow is dampened by the hydraulic battery and the safety valve. If the impact is too strong then bolts (1, Drawing 7) of the rear axle of the rotating hydraulic cylinder may also break. In this case the cylinder moves back through the fastening hole and the plough can move back freely. When the bolts of the rear axle break the hydraulic hoses may break as well. Bolts are strength grade 10.9 regular bolts and must be replaced afterwards. It is important to remember to use Nord-Lock washers (2, Drawing 7) when replacing the bolts.



Drawing 7. Rear attachment of the rotating hydraulic cylinder

In travelling position the plough must be locked with the fastening plate (2, Drawing 8) to the joint (1). Position of the fastening plate is adjustable as needed by using additional holes in the plate.



Drawing 8. Locking the plough in travelling position

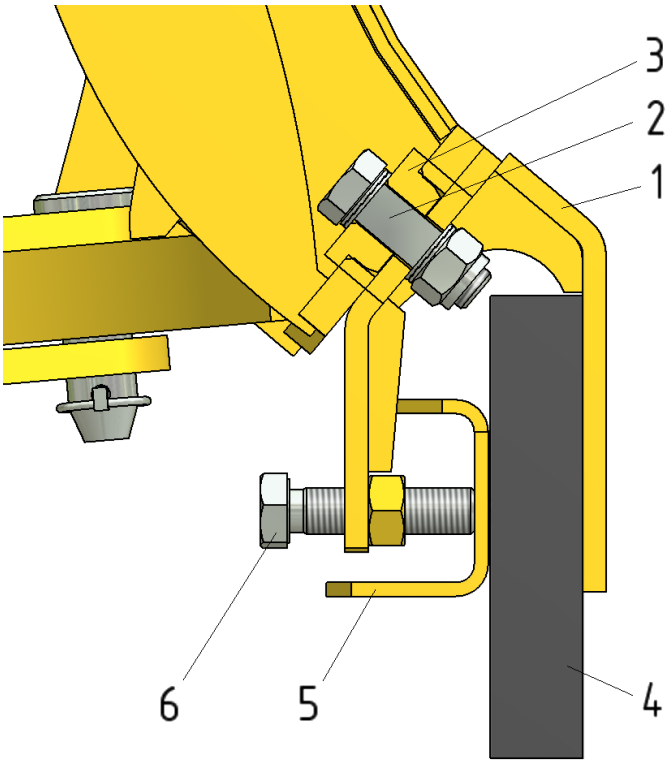
4.1 Replacing the blade holders

Different blades must be used in different weather conditions. In early winter when the ground is not frozen the rubber blades should be used for snow clearing from road shoulders. In that case the plough's moldboard does not dig into the ground. When the ground is already frozen and there is compressed snow on the sides of the road, steel blades should be used for snow clearing.

4.1.1. Removing and installing the rubber blade holder

- To remove the rubber blade holder release the bolted joint (2, Drawing 9).
- Remove the blade holder with the rubber blade, fastening plate and bushings (Drawing 9, positions 1, 4, 5 and 3).

The rubber blade holder is installed in the same way only in reverse order. When fastening the bolt joint (2, Drawing 9) remember to use Nord-Lock washers under the bolt head as well as the Nylock nut.



Drawing 9. Installation of the rubber blade holder

Before installing the rubber blade holder be sure to remove the side blade holder with the side blade from the moldboard of the plough and the steel blade holder (Drawing 3, positions 10, 12, 20-23).

4.1.2. Replacing the rubber blade

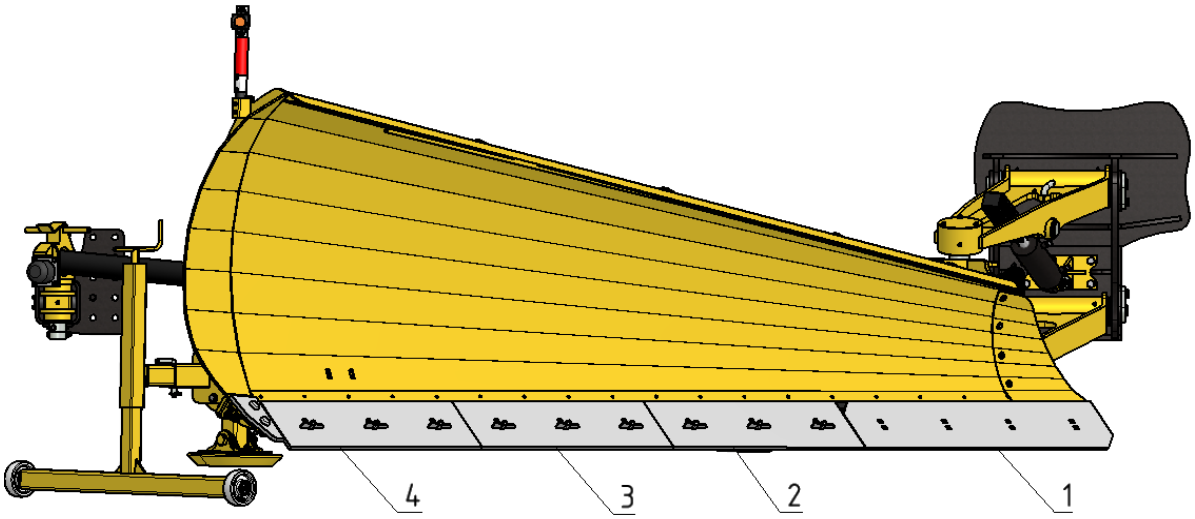
- Release the bolts (6, Drawing 9).
- Remove the worn-out rubber blade (4).
- Place a new rubber blade (4) between the blade holder (1) and the fastening plate (5).
- NB! Length of the rubber blade should match with length of the blade holder (Drawing 10, Table 3).
- Tighten the plate (5) against the rubber blade using bolts (pos. 6 – tightening torque 60-70 Nm).

Locations of the side plough blades are shown in drawing 8 and lengths of the respective positions according to the plough models are described in table 3.

	Position on drawing 9	Plough model	
		KSM3103	**KSM3703**
Width of steel blades, mm	1	915/1220*	915/1220*
	2	915	915
	3	1220	915
	4	-	915
Width of rubber blades, mm	1	915/1215*	915/1215*
	2	915	915
	3	1215	915
	4	-	1000

Table 3. Lengths of the side plough blades

* - in case of extension

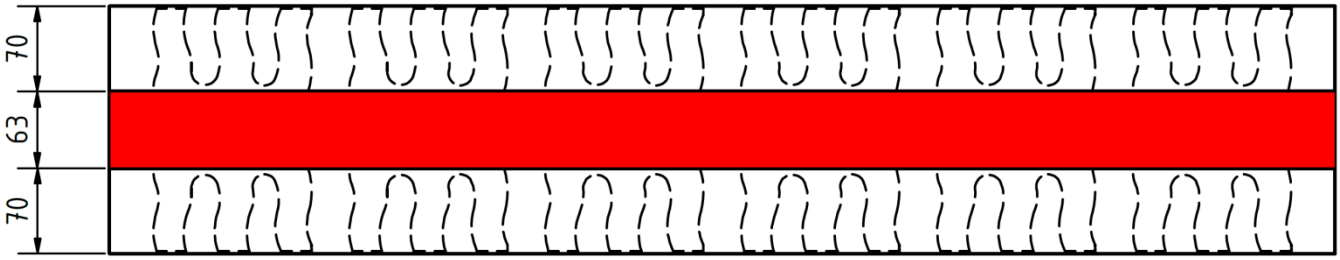


Drawing 10. Location of the blades

4.1.3. Description and use of Hardox rubber blades

Hardox rubber blades are highly durable rubber blades with Hardox metal reinforcement that withstand difficult conditions better than standard rubber blades and ensure significantly longer lifetime thanks to wear resistant metal. Hardox blade is suitable for use instead of rubber blade with all snow ploughs. Hardox rubber blade includes steel blade segments surrounded by rubber.

Hardox rubber blade can be used on both sides up to the red area marked on the blade. If one side of the blade is worn out up to the red area, turn the blade over and use the other side until it reaches the red area. Hardox rubber blade wear must not exceed the red line, i.e. 70 mm on both sides



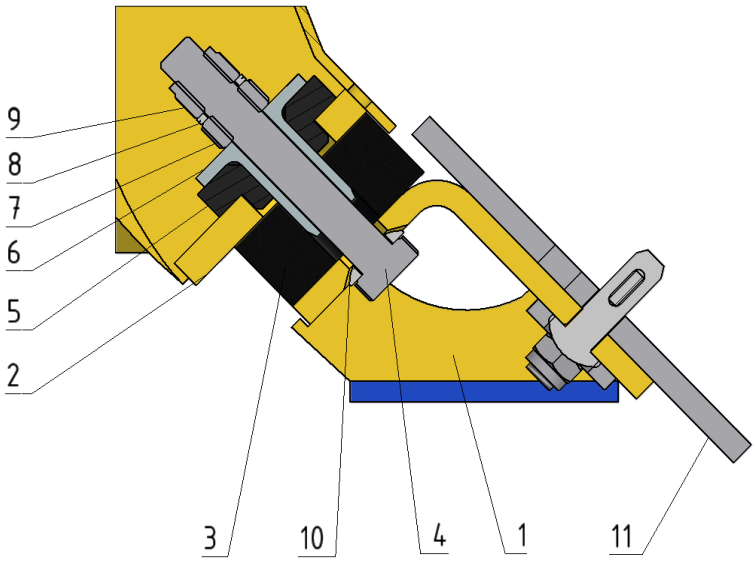
Drawing 11. Hardox rubber blade

4.1.4. Fastening of the blade holder

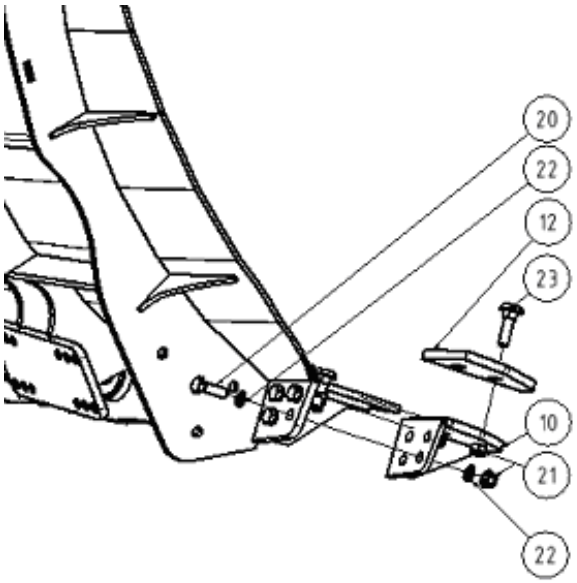
- Place the rubber bushings (5) into the holes of the plough's moldboard (2, Drawing 12).
- Place the required 45 mm rubber strip (3) between the steel blade holder (1) and the plough's moldboard.
- Press the steel bushings (6) through the rubber bushings (5) into the holes in the rubber strip.
- Fasten the blade holder with bolt (4) by placing a conical washer under the bolt head. Then screw a regular nut (pos.7 – tightening torque 60-70 Nm) on the steel bushing, add a Nord-Lock washer (8) and secure with a Nylock nut (9).
- Fasten the side blade holder together with the side blade (Drawing 12, positions 10, 12, 20-23).
- NB! Length of the steel blade (11, Drawing 12) must match with length of the blade holder (Drawing 10, Table 3).

The steel blade holder is removed in the same way only in reverse order.
Blade attaches to the blade holder in a standard way: with wedge-bolts or other bolts.

Cut the corners (Drawing 4, pos. 6 and Drawing 10, pos. 1) of the front steel blade diagonally (phase 60x45° or radius R50)!



Drawing 12. Fastening of the blade holder

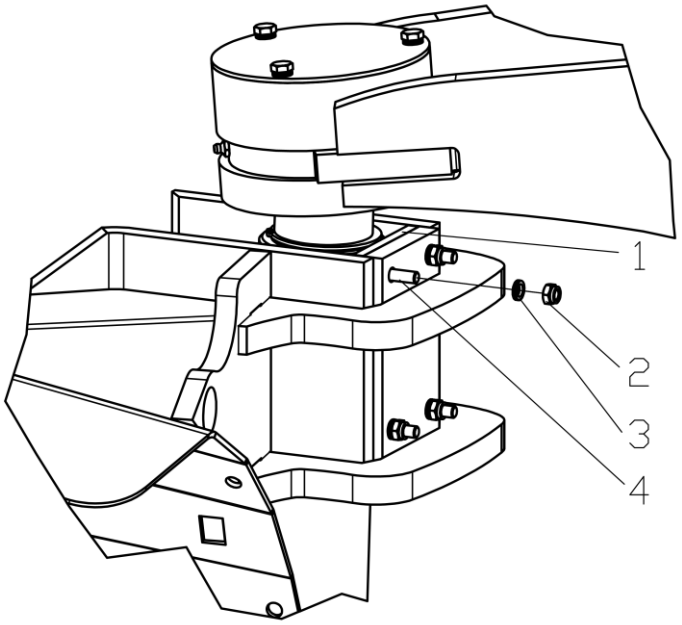


Drawing 13. Installing the side blade

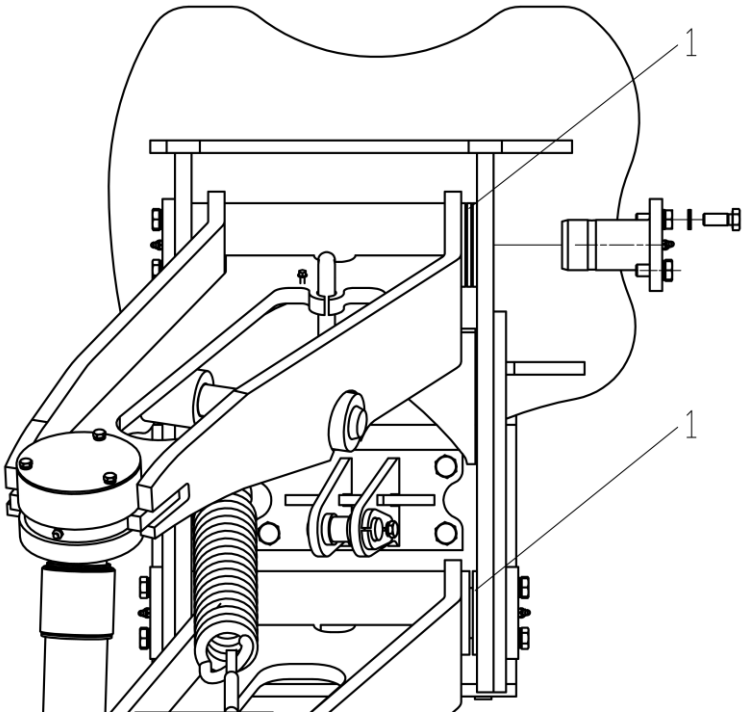
4.2. Adjusting the corner of the plough's moldboard

The angles of the moldboard in relation to the horizontal surface can be adjusted as needed by adding or removing plastic plates (1, Drawing 14) between the moldboard of the plough and the pivot. Use one plastic

plate by default.
It is also possible to adjust the arm with washers (Drawing 5). The washers can be placed on the left or right side of the arm. By default, two washers are placed on the right side of the upper arm and one washer on both sides of the lower arm (1, Drawing 5). Position of the fastening plate (2, Drawing 8) can be adjusted as needed.



Drawing 14. Adjusting the corner of the plough's moldboard



Drawing 15. Adjusting with washers

4.3. Using skid shoes

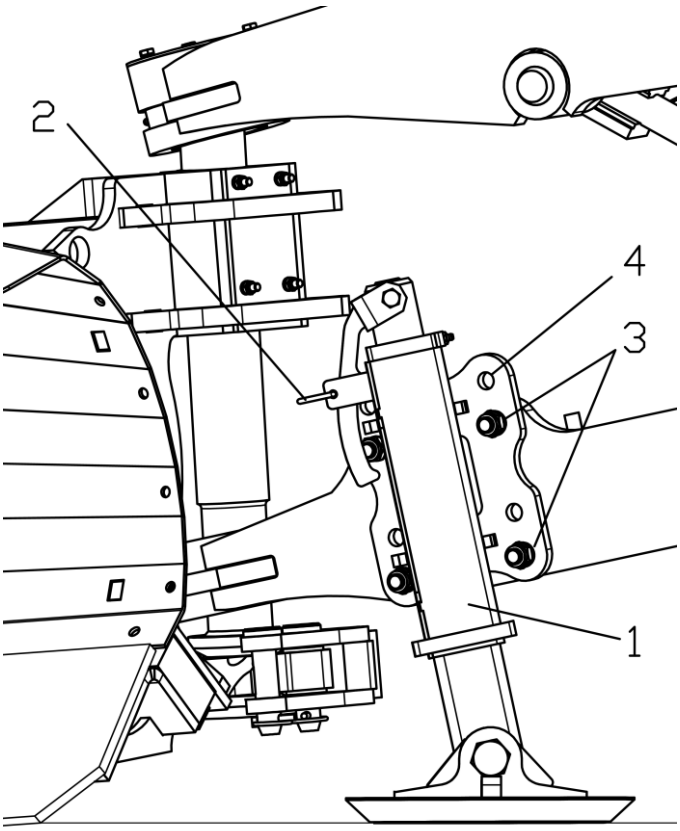
Depending on the equipment the plough may be equipped with two skid shoes. One can be attached to the moldboard (rear skid shoe) and one to the parallelogram (front skid shoe). When using the **moldboard extension**, **do not use** the skid shoe attached to the parallelogram.

Both skid shoes can be used with **steel blades** and without the **moldboard extension**. Skid shoes must be adjusted so that the steel blades are 0-15 mm above the ground (depending on the road surface). Avoid excessive wear to the slide foot as it may break and fall off. Always install the handle splint (2, Drawing and Drawing 17) after adjusting the skid shoe in order to keep the skid shoe at desired height.

4.3.1. Using skid shoe on KSM3103

In case of steel blades both skid shoes can be used. Fasten the front skid shoe by using the lower holes (3, Drawing 6)

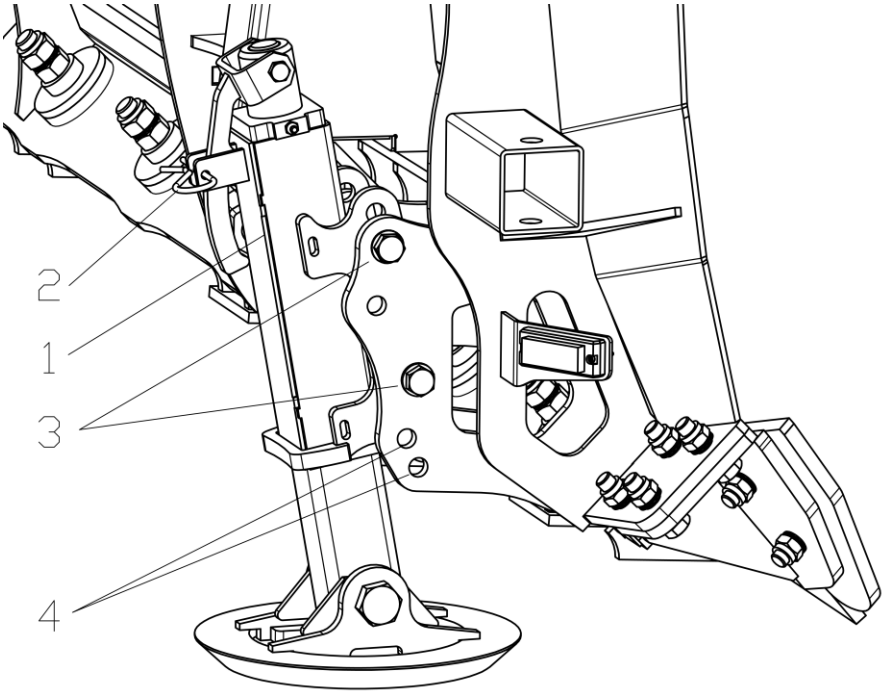
In case of rubber blades only the front skid shoe can be used. Fasten the skid shoe by using the upper holes (4, Drawing 6).



Drawing 16. Front skid shoe

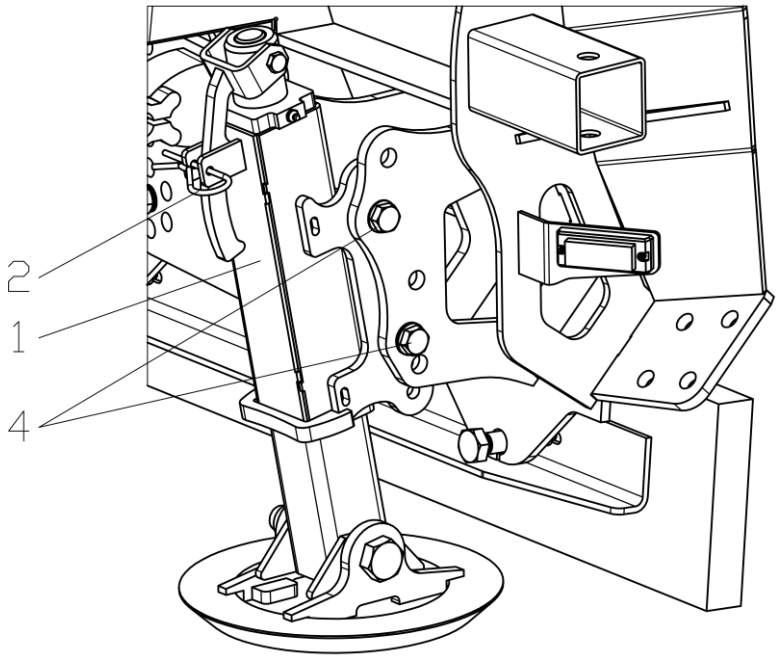
4.3.2. Using skid shoe on KSM3703

In case of steel blades both skid shoes can be used. Fasten the front skid shoe by using the lower holes (3, Drawing 6). Fasten the rear skid shoe by using the front holes (3, Drawing 6).



Drawing 17. Rear slide foot when using the steel blades

In case of rubber blades both skid shoes can be used. Fasten the rear skid shoe by using the rear holes (4, Drawing 18).

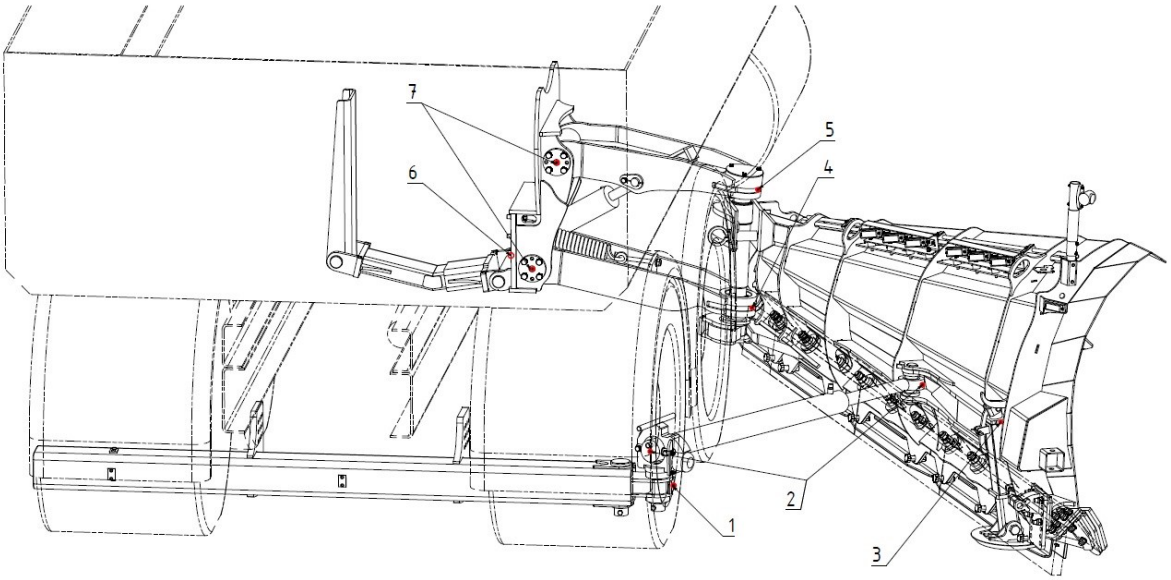


Drawing 18. Rear slide foot when using the rubber blades

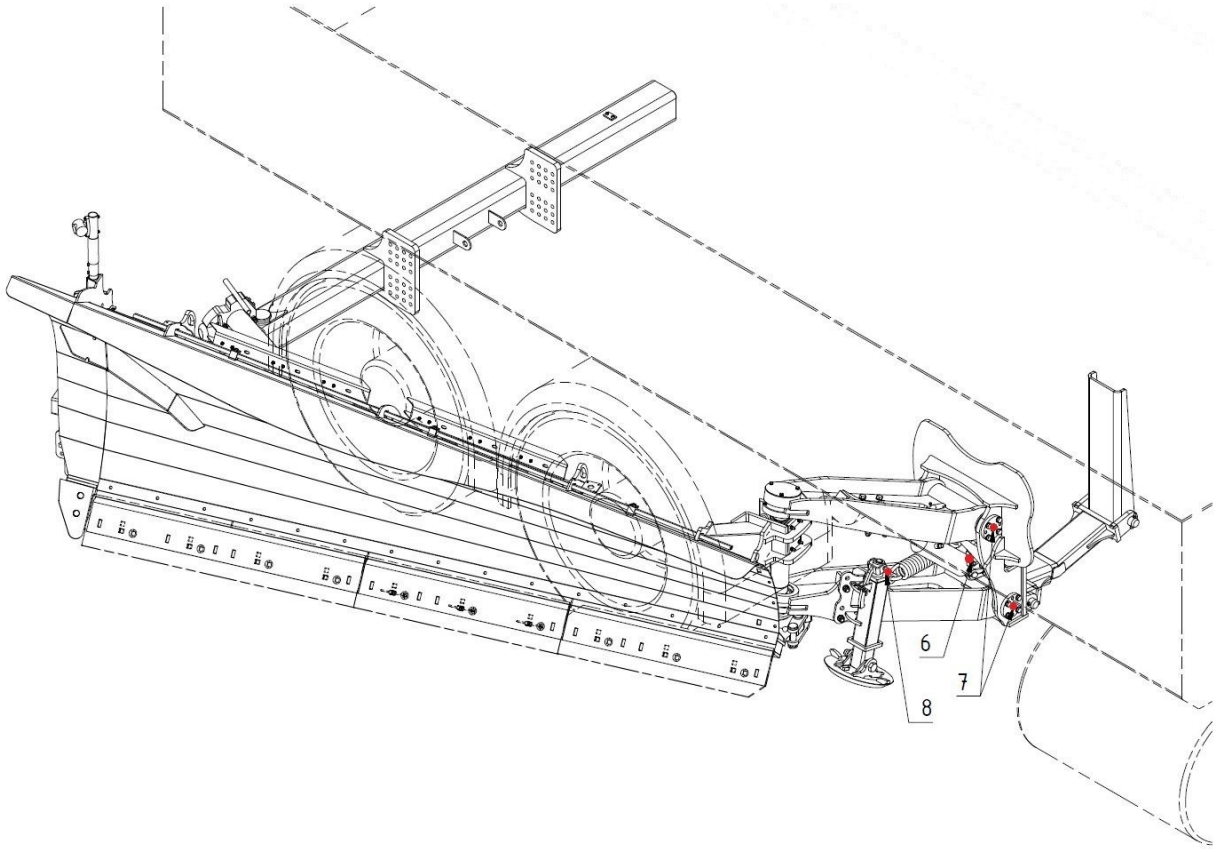
5. MAINTENANCE OF THE SNOW PLOUGH

MAINTENANCE IN EVERY 8 WORKING HOURS	MAINTENANCE IN EVERY 150 WORKING HOURS	MAJOR SEASONAL MAINTENANCE
Check all bolt connections and hydraulic connections and tighten, if required.	Check all bolt connections and hydraulic connections and tighten, if required.	Check all bolt connections and hydraulic connections and tighten, if required.
Check that there are no leakages in the hydraulic system. If required, tighten the connections of the hydraulic parts and hose ends	Grease all the grease points: grease nipples on the cylinders, horizontal and vertical pivot of the lift arms of the plough, rear attachment of the plough and the skid shoe as well.	Check that there are no leakages in the hydraulic system. If required, tighten the connections of the hydraulic parts and hose ends.
Check the condition and fastening of the cutting edges. If required adjust the cutting edges or replace them.	Check the condition and fastening of the cutting edges. If required adjust the cutting edges or replace them.	Spray the zinc coated parts, hydraulic valves and hose ends with rust resistant wax.
X	X	Grease all grease points. Also grease or wax the extended adjustment surfaces of the internal pipe of the wheel mechanism.
X	X	Check the plough visually and see if there are parts that need to be replaced
X	X	Repair all paint damages
X	X	Retract the piston rod of the cylinder and cover it with proper grease
X	X	Store the plough in a place exposed to winds but protected from rain and UV-rays.

5.1. Grease points



Drawing 19. Grease points



Drawing 20. Grease points

Pos. No	Location of grease points	Quantity
1	Bracket of rear axle	1
2	Pivot cylinder	2
3	Skid shoe, rear	1
4	Lower lever of parallelogram	1
5	Upper lever of paralellogram	1
6	Lifting cylinder	1
7	Flange axles	4
8	Skid shoe, front	1
	In all	**12**

Table 4. List of grease points

6. WARRANTY CONDITIONS OF THE PRODUCT

- The seller shall give the product a warranty period of 12 (twelve) months. The warranty period shall begin when the product is transferred to the purchaser, the delivery time shall be the date specified on the instrument of delivery and receipt or the CMR consignment note.
- The warranty shall cover the elimination of discovered manufacturing, material or structural defects of the product by the seller. The seller shall be obligated to replace the defective product with a new one only if the product or its component parts cannot be repaired or the detail cannot be replaced.
- The purchaser shall agree to notify the seller in writing within 7 (seven) calendar days of becoming aware of the defect, describing the defect with sufficient accuracy.
- The seller shall be required to carry out an expert analysis to identify the causes of the defect within fourteen (14) business days after the purchaser's written notice of the warranty case. If the cause is covered by the warranty, the seller shall eliminate it within 20 (twenty) working days after the expert analysis is carried out.
- Warranty repairs shall be carried out at the shipping address specified in the order confirmation. Repair work of larger scale shall be carried out in the territory of the seller. Cost of transporting the product for warranty repair shall be paid by the purchaser. The purchaser shall cover the expenses and transport costs for repair works excluded from the warranty terms and conditions.
- Warranty shall not cover defects which are caused:
  - as a result of natural wear and tear of the product;
  - as a result of road surface characteristics or damage thereof;
  - in connection with the use of the product contrary to the technical requirements, safety regulations and intended purpose;
  - due to failure to observe the maintenance requirements of the product;
  - due to a traffic accident;
  - of which the purchaser has not notified the seller in writing within 7 (seven) days following its occurrence, and / or the purchaser has not given the seller an opportunity to determine the cause of the defect pursuant to the contract;
  - in the extent to which the increasing of the defect could have reasonably been prevented by the seller.
- Product warranty shall expire prematurely from the time when:
  - the product is repaired independently without acquiring a prior written approval from the seller;
  - the design is changed, additional equipment and / or spare parts have been installed independently without acquiring a prior written approval from the seller.
- In the event that the seller, despite repeated written appeal from the purchaser, fails to fulfil its warranty obligations under the contract, the purchaser shall have the right to repair the product at the cost of the seller. The purchaser must notify the seller in writing at least (5) five business days prior to the replacement or repair of the defective product, and provide a reasonable estimation of the expected cost.
- The purchaser may withdraw from the contract and demand the collection of the product and refund only in the event that there is a defect which cannot be repaired or a part which cannot be replaced, and the replacement of the defective product with a new product would also not give results which would allow using the product as intended.
- The warranty for the product or its part replaced during the warranty period shall cover the product or its part until the end of the general warranty period.